



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,195	01/28/2004	Satish Sundar	8243/DSM/BCVD/JW	5733

44182 7590 03/31/2006

PATTERSON & SHERIDAN, LLP
APPLIED MATERIALS INC
595 SHREWSBURY AVE
SUITE 100
SHREWSBURY, NJ 07702

EXAMINER

DHINGRA, RAKESH KUMAR

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/767,195

Applicant(s)

SUNDAR, SATISH

Examiner

Rakesh K. Dhingra

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 6,7,9 and 12-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8,10 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of species 1, (Figures 1, 2A, 2B) in the reply filed on 02/03/06 is acknowledged. Applicant has stated that claims 2-5, 8, 10, 11 and 14-18 are readable on species 1.

Examiner responds that claims 14-18 pertain to species 5 (Figures 1, 3) {non-elected species} and accordingly these claims are withdrawn from further consideration. Thus claims 6-7, 9, 12-13 and 14-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species 2-7, there being no allowable generic or linking claim.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Figure 4 – "spring 460" is not shown in drawing as disclosed on paragraph 0040, line 1 of specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

Art Unit: 1763

corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:

- 1) Paragraph 0022, line 17 – “illustrated in Figure 1” should read as “illustrated in Figure 1A”.
- 2) Paragraph 0030, line 2 – “illustrated in Figure 1B” should read as “illustrated in Figure 1A”.
- 3) Paragraph 0035, line 9 – “shaft 260” should read as “shaft 360”.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 2 are rejected under 35 U.S.C. 102(a) as being anticipated by Arai (US PG PUB No. 2003/0075109).

Regarding Claim 1: Arai teaches an apparatus (Figures 1, 2) comprising:

a reaction chamber (chamber body) 11 having a bottom;
a vertically moveable susceptor (substrate support) 12 disposed in the chamber body and having a first side adapted to support a wafer (substrate) 20 during processing,
at least three lift pins (elements) 13 movably coupled to the substrate support in a

Art Unit: 1763

spaced-apart relation proximate a perimeter of the substrate support;
a first end of each lift pin 13 extending beyond the first side 12c of the substrate support, the first end adapted to engage an edge of the substrate 20, and
a second end of each element positioned below a second side of the substrate support 12 and adapted to engage the bottom of the chamber body when the substrate is in a lowered position (Paragraphs 021, 0022).

Regarding Claim 2: Arai teaches the susceptor (substrate support) 12 further comprises at least three apertures 12b adapted to receive the three lift pins 13 there-through (Paragraph 0022).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai (US PG PUB No. 2003/0075109) in view of Hirose et al (US Patent No. 6,104,002).

Regarding Claims 3, 4: Arai teaches all limitations of the claim except the three apertures disposed through the substrate support are sized to accommodate a pre-defined radial displacement of the at least three elements.

Hirose et al teach an apparatus (Figures 3-5) that comprises a chamber 21 having a support plate (substrate support) 22 that has plurality of holes 28 for passage of support pins 30 and where the holes 28 are large enough to permit horizontal movement

Art Unit: 1763

(includes radial) of pins 30. Hirose et al further teach that extent of horizontal (includes radial) movement can be set (pre-defined) as per other relevant considerations like length of support pin, and width of leg portion 30a. Hirose et al also teach that support pins 30 are movable in up/down direction through support plate (substrate support) 22, due to movement of holding member 31 that is attached to lift mechanism 33 (Column 5, line 20 to Column 6, line 5).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide for radial displacement of pins in the holes in substrate support as taught by Hirose et al in the apparatus of Arai to reduce particle generation as a result of contact between support pin and internal wall of the hole in the substrate support (Column 2, lines 1-35).

Claims 5, 10, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arai (US PG PUB No. 2003/0075109) in view of Hirose et al (US Patent No. 6,104,002) as applied to Claim 4 and further in view of Meares et al (EP 0290218).

Regarding Claim 5: Arai in view of Hirose et al teaches all limitations of the claim except that each of the at least three elements is adapted to rotate about an axis substantially parallel to a plane of the substrate support.

Meares et al teach an apparatus (Figure 8) that includes a platen (substrate support) P that supports wafer W with the help of plurality of fingers (elements) f1 – f4 and where the fingers f experience rotational motion about pivot arc Pa when the wafer is gripped by the fingers (Column 8, lines 10-30).

Art Unit: 1763

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to provide for rotational movement of fingers (elements) as taught by Meares et al in the apparatus of Arai in view of Hirose et al to properly engage and disengage the wafer (Column 1, lines 45-50).

Regarding Claims 10,11: Meares et al teach that fingers f are biased (pivoted) about Pa by the resilient spring portion (biasing members) 41a that are also coupled around pivot Pa. Meares et al do not teach that the resilient spring portions (biasing members) are torsion springs, but teach that geometry of collet 41 (means including resilient spring portions) could be selected (could include torsion springs also) depending upon other related parameters (Column 7, lines 10-330).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai (US PG PUB No. 2003/0075109) in view of Hirose et al (US Patent No. 6,104,002) as applied to Claim 4 and further in view of Gibson et al (US PG PUB No. 2003/0118741).

Regarding Claim 8: Arai in view of Hirose et al teaches all limitations of the claim except that second end of each of the elements comprises a roller.

Gibson et al teach a substrate support apparatus where due to vertical space constraint, rollers are attached to ends of vertically oriented lift pins that move wedges horizontally as the pins move vertically (Paragraph 0027).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use rollers attached to second end of pins (elements) as taught by Gibson et al in the apparatus of Arai in view of Hirose et al to facilitate vertical movement of wafer in space constrained chuck assemblies (Paragraph 0027).

Art Unit: 1763

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

L

Rakesh Dhingra

PA

Parviz Hassanzadeh
Supervisory Patent Examiner
Art Unit 1763